How to promote a job change of dumpsite waste pickers?

Evidence from a field experiment in the Philippines

Maki Ikuse [†], Hide-Fumi Yokoo [†] [1], Aries Roda D. Romallosa [‡]

and Masahide Horita [†]

[†] The University of Tokyo

[‡] Central Philippine University

May, 2014

Abstract

Switching a waste disposal policy from open dumping to sanitary landfilling requires a job change of waste pickers. We conducted a field experiment at Iloilo in the Philippines which offers dumpsite waste pickers a new job of producing paper briquettes fuels. Randomly distributing four different types of offer letters, we examine how the differences in compensation schemes affect decision to take up an offer. Offer letters differ in two aspects, how to determine the level of salary and frequency of the payment. We offered an alternative job to 112 dumpsite waste pickers. 17 (15.2 percent) of them took up a new job and stopped picking waste. Those who received the offer with the once in three days payment were significantly more likely to take up compare to the everyday payment. A compensation scheme of pay per performance with once in three days attracted 27 percent of those who received it. Women were more likely to, risk averse individuals were less likely to, and patient individuals were more likely to take up a new job.

Keywords: Compensation scheme, Field experiment, Job change, Waste management, Waste picker

---

[1] Corresponding author. Email: yokoo@k.u-tokyo.ac.jp.

1. Introduction

Public policies often require job changes to workers in specific industries and resettlement of residents living in specific areas. For example, infrastructure projects such as construction of dams or roads often require involuntary resettlement of residents and a job change to farmers. Further example is a shift of municipal solid waste disposal policy from an open dumping to a sanitary landfilling which requires a job change of people who pick up recyclable waste at a dumpsite. These people are called *waste pickers* and are working at open dumpsites in many countries (Medina 2007, Wilson et al. 2009).

Open dumping is widely used waste disposal policy, mainly in developing countries. However, this method entails several environmental problems such as bad smell and dirty leachate. Switching to modern environmentally friendly methods result in landfilling or burning waste. Thus it will inevitably disturb a job of waste picking (Paul et al. 2012). Therefore waste pickers oppose this policy change. In order to switch a waste disposal policy without conflicts, it is better to consider promoting a job change of waste pickers. Municipalities have incentives to offer alternative jobs to and effectively induce job changes of waste pickers.

There are two steps towards inducing a job change of workers in a specific industry. First, municipalities have to find or create employment. This is very difficult task. There would be no such a case that a municipality can provides an attractive job to targeted workers. This is because if there is such a job opportunity, they were already taking up it. Thus municipalities have to promote job changes to not much attractive jobs in terms of the level of salary or working conditions. Second, given this alternative job, municipalities want to as many as possible targeted workers to take up it. These two

steps would avoid or minimize conflicts coincide with implementation of a new environmental policy.

There are case studies on involuntary resettlement or unemployment which happens with implementation of public policies such as shown above, however, there is no study which examines how to promote as many as possible workers to take up an alternative job. If a job change of workers will make implementation of public policies smooth, municipalities then should consider an effective method to induce it. This study considers the second step mentioned above which municipalities already found enough employment. Assuming such a situation, we conduct a field experiment at the dumpsite in the Philippines to examine whether changing compensation schemes of job offers would increase the number of waste pickers who take up it.

Targeted industry of this study is waste picking. We will explain this industry in detail in the next section. We proposed waste pickers a simple work of producing solid fuels made from waste papers (*paper briquettes*). We called for workers who join this business using four different types of offer letters. The first one is that the level of compensation will be determined by workers production level. The second one is mix of output-based and the fixed compensation. The fixed compensation in this scheme is called *a draw* (Lazear 1998). The third one is the fixed compensation scheme which the level of it is independent of how much they produce. All the three offers above will make the payment once in three days. Instead, the fourth one will pay everyday with the output-based compensation level. We randomly distributed these four types of job offers to 112 waste pickers. Each one of them received only one type of the offer letter. We observed the numbers of recipients who took up our offered job and stopped picking waste.

From our analysis, we found that even with a highly uncertain compensation offer, we can induce job changes of more than 20% of dumpsite waste pickers. This means, however, about 80% of them do not take up a new job even there is an opportunity, and keep working at a dumpsite.

The payment frequency of once in three days is attractive compare to everyday for dumpsite waste pickers in our experiment. This is some extent surprising since they are considered as poor and in strict liquidity constraint. Possibly it occurred since everyday payment reminds a hard work. Or, it might be the case that as is demonstrated in temptation models by Gul and Pesendorfer (2001, 2004), dumpsite waste pickers do recognize their temptations to consumption and restricted themselves with once in three days payment to increase savings.

This study provides practical insights to those thousands or millions of municipalities which have open dumpsites. Our findings contribute to municipalities that considering a switch from open dumping to landfilling with promoting a job change of dumpsite waste pickers. This will help municipalities to smoothly implement modern waste management. This study contributes to both supporting livelihoods of dumpsite waste pickers and managing municipal solid waste appropriately at the same time.

This paper proceeds as follows. Section 2 explains a business of waste picking in detail. Section 3 discusses a simple model of a job change and examines wage payment schemes following the Personnel economics. Section 4 describes the instrument of the interview survey and the experimental design, and then presents the estimation strategy. Section 5 presents empirical results. Section 6 concludes.

2. Business of waste picking

2.1 Dumpsite waste pickers in the world

Dumpsite waste pickers have been observed for such a long time widely in the world. Several waste management researchers report it from, for example, the United States and Mexico (Medina 1999), India (Hayami et al. 2006, Gill 2007), Pakistan (Asim et al. 2012), Indonesia (Sasaki and Araki 2013), the Philippines (Paul et al. 2013), Brazil (Gutberlet and Baeder 2008, Tirado-Soto and Zamberlan 2013), and Nigeria (Agunwamba 2003, Nzeadibe 2009). These previous studies descriptively introduce and report business practices or working conditions of waste picking at dumpsite.

A business of waste picking can be categorized into two types. One is called *street waste picking* which works along streets. Another is called *dumpsite waste picking* which works at an open dumpsite. An open dumpsite is a final disposal spot where a municipality brings collected solid waste and just throws it on a hill of waste. This final disposal method entails several environmental problems such as bad smell and dirty leachate. The worst economic loss regarding to an open dumpsite is that once we introduce this disposal practice, we cannot use that land for a long time. The method of landfilling digs a hole at a spot, throw solid waste into it, and then cover it by soil. Using this method, in contrast to an open dumping, we can control leachate and use the land, for example, as a park. In this sense, landfilling is environmentally friendly and economically beneficial compare to an open dumping.

This study focuses on dumpsite waste pickers. They are picking recyclable waste at open dumpsites. As far as there is no household recycling program in a municipality, they can collect sellable products such as waste papers, cans, glass and plastic bottles and metals. They collect recyclable waste and sell it to wholesale stores called *junk*

shops. Since dumpsite waste pickers are separating recyclables from other waste and selling it to producers, we can consider their business is contributing to reducing final disposal waste and conserving resources.

There are several features of dumpsite waste picking which we have to refer to. First, they can obtain cash everyday by selling waste to junk shops. This frequent cash flow might help a livelihood of them. Second, working conditions of this business is quite bad. They have to work outside, up on a hill of waste. Smells bad, flies are crawling elsewhere, and very difficult to work when it rains (but they actually do). Furthermore, in tropical countries such as the Philippines, high temperature and strong sunlight will affect badly to health of workers. Third, nevertheless of these bad conditions, there are a quite few of female workers.

Fourth, they are not employed by anyone. Although some studies report groups of dumpsite waste pickers within one dumpsite that are fighting for spheres of influence (Sasaki and Araki 2013), it does not mean they are employed by bosses. In general, they act individually and earn cash directly from a junk shop. This implies they do not need to care about working time. They can work whenever they want, and even they can bring their children into working place. This flexibility of the job might be one reason that there are many female workers.

Fifth, there are rising movements to develop an association of waste pickers (Paul et al. 2012, Tirado-Soto and Zamberlan 2013). The objective of associations are supporting each other, and obtaining a bargaining power against junk shops by selling recyclables together. Sixth, it seems entry to this industry is easy. It does not require a large capital or education records.

There is a controversy about whether dumpsite waste pickers are in poverty or not.

Wilson et al. (2006) argues that they are in poverty, but Medina (1999) found that dumpsite waste pickers working at the boarder of the United States and Mexico earn 59 USD per week on average, which is relatively high income level. Such a debate occurs since there are no enough quantitative surveys on waste pickers. Few studies focused on income level of waste pickers, for example, Medina (1999), Agunwamba (2003), Hayami et al. (2006), Gutberlet and Baeder (2008), and Asim et al. (2012). However, all of those are small size surveys and the largest one is a sample size of 60 by Asim et al. (2012).

The one reason why we lack surveys on waste pickers is that many of them do not have mailing address nor personal IDs, and therefore it is very difficult to undertake comprehensive surveys. Because of these situations, they are often called *informal sector*. In most cases, population of dumpsite waste pickers who are working at a certain dumpsite is unknown. Therefore we cannot under take a random sampling (Hayami et al. 2006). Our study also has this problem. We tried to make interviews for all the waste pickers working at our targeted dumpsite through 10 days survey by 4 enumerators. Finally, we could interview 240 dumpsite waste pickers which the sample size is four times larger than the previous studies. Then, we distributed job offer letters to 112 of them, a subset of interviewed. We will show the results of the interview survey in the next subsection 2.2 and 4.4.

As we already discussed above, an open dumping incurs social cost. However, if a municipality decides to switch a waste disposal policy, it would often rob dumpsite waste pickers of their livelihoods. Thus they are opposed to the switch of a policy. For example, dumpsite waste pickers opposed a shutdown of a dumpsite in Fez, Morocco, and they started a riot. Finally, police suppressed it. In Manila, the Philippines, the city

7

government once decided to switch from open dumping to sanitary landfilling and actually did it, however, they constructed a new *open dumpsite* and closed the landfill site because of the opposition of waste pickers.

There is a growing concern for municipalities in developing countries to managing solid waste appropriately while sustaining livelihoods of dumpsite waste pickers. One solution for this problem is to provide alternative livelihoods to dumpsite waste pickers before switching to a modern disposal practice (Medina 2000). A municipality which is trying to tackle this task as a front runner is the city of Iloilo, the Philippines where we chose as a research field.

2.2 Dumpsite waste pickers at Iloilo, the Philippines

Iloilo city is the capital of the Iloilo province in Panay Island. The population of the city is 437,366 in year 2012 and the size is 78.34 kilometers square. A private contractor collects municipal solid waste using 31 trucks. Everyday, it collects and brings waste to the Calajunan open dumpsite (10 ha) which locates northern part of the city. The dumpsite is managed by the city government. On average, 220 tons per day is collected and brought into the dumpsite (Paul et al. 2012). There is no household recycling program implemented and therefore all waste is mixed together. This final disposal site is a typical open dumpsite.

Iloilo city government started to consider a switch to a sanitary landfill in 2006 since the current dumpsite reached nearly a full capacity. Furthermore, the city examines introduction of a waste gasification facility since 2013. The current plan of the city is that it will shutdown the Calajunan dumpsite until the end of 2015 and will shift to more sanitary management methods.

Since 2006, the city government with helps of German International Cooperation (GIZ) and a local NGO started programs of supporting livelihoods of dumpsite waste pickers (Paul et al. 2012). The objective of these programs are, supporting poor workers at the dumpsite, promoting them to stop picking waste and providing an opportunity of an alternative job in order to smoothly shutdown the dumpsite.

Paul et al. (2012) descripts those livelihood programs in detail. One alternative job that the city government has just started to provide is production of briquettes made from waste papers generated at Central Philippine University. This product can be used as fuels for cooking which can be a substitute for charcoal. Our study adopts this job as an alternative job for waste picking.

Along with providing alternative livelihoods, the city government and GIZ developed an association of dumpsite waste pickers. Waste pickers who satisfy several conditions have a right to join this association. Whether or not become a member is optional and up to waste pickers. This association works as a workers union and provides social securities. Also it provides personal IDs and buys recyclable waste to sell together. We were supported by the executive of this association when we undertook our field experiment.

We conducted an interview survey of 240 adult (18 years old and older) waste pickers who work at the Calajunan dumpsite in August, 2013. We interviewed those who do not receive any livelihood program from the city government yet. We asked demographic and economic questions. In addition, we asked willingness to accept (WTA) a shutdown of the dumpsite for a month of December 2013, and also asked hypothetical risk and time preferences questions. One interview took around 30 to 45 minutes. The questionnaire sheet of this survey is attached in Appendix 1.

9

A brief summary of this interview survey is as follows. The average age of 240 waste pickers is 34.9 years old. A share of female was 52%. The average years of education is 7, the smallest is 0 and the largest is 13. The average daily earnings by waste picking is 123.8 PHP (Philippine pesos). This is lower than a half of the minimum wage of private sector at Iloilo (245-287 PHP). The exchange rate on November 27th, 2013 was 1 USD = 43.74 PHP and thus the average of 123.8 PHP equals to 2.83 USD. The lowest daily earning is 30 PHP and there are 6 observations in our sample. All the 6 lowest earning workers were female. There are 11 (4.6% of the sample) waste pickers who earn more than the minimum wage. The highest daily earnings is 480 PHP (10.97 USD).

3. Job change and compensation schemes

3.1 Simple model of a job change

We develop a simple theoretical framework of a decision to change a job by a worker. We model the job change decision making as a binary choice. Consider a decision between staying at a present job and taking up a new job. What they do at the present job and a working condition of it is known from the experience. On the other hand, in general, workers do not have enough information about new jobs. Furthermore, the level of salary is highly uncertain if the compensation scheme adopts the output-based measure of performance. Even though the level of salary is uncertain, a compensation scheme other than it and working conditions are often mentioned in job offers.

We begin here with a simple theoretical model for choosing a new job versus

remaining a present job. Let s be the level of salary. Considering a performance pay compensation scheme (output-based measure), s can be denoted as a function of output of a worker, f. If a compensation scheme is a fixed pay, then s is independent of f. Next, output of a worker f can be defined as a function of their effort e. Assume that worker's utility (U) depends on the level of salary, effort paid for it, and working conditions ($\overline{w_{pre}}$ and w_{new}). Upper bar indicates it is known by a worker. Variables are labeled pre if it indicates a present and new if it indicates a new job. We assume $\partial U/\partial s > 0, \partial U/\partial e < 0$ and $\partial U/\partial w > 0$. Then a binary variable of taking up a new job (C) takes 1 if,

$$U(s_{new}(f_{new}(e)), e, w_{new}) > U\big(s_{pre}(f_{pre}(\bar{e})), \bar{e}, \overline{w_{pre}}\big).$$

A worker has to estimate the level of salary at a new job and guess how much effort is required for it and working conditions of it. According to her/his estimate, if a worker judged utility of taking up a new job is higher than the known level of present utility, she/he takes up a new job ($C = 1$).

3.2 Compensation schemes

A problem for a municipality is that maximizing individuals who take up an offered job without making a loss from an operation of that business. Furthermore, it wishes workers to produce as many as possible.

We examine what we shall write in a job offer letter. A municipality has to mention necessary information on it. It should describe an offered job in detail. Working time, place and conditions are also required. Finally, a compensation scheme should be shown on the letter. Then, what kind of compensation schemes will attract more workers while promoting them to pay effort and produce more?

Personnel economics provides us the theory of optimal compensation (Lazear 1995, 1998). The theory tells us that when a firm can observe output of workers costlessly, it should pay depending on it. This output-based payment of the compensation is called *performance pay*. When a firm can observe worker's output, an optimal level of the compensation should satisfy,

$$\text{Production cost} + \text{Total compensation} = \text{Total revenue}.$$

If production cost such as expenditure for materials is variable cost, paying marginal revenue minus marginal production cost for one unit of output to a worker will make the level of effort by a worker optimal. Such a compensation scheme gives workers an incentive to work as much as they can without making a loss to a firm.

The objective of this study is to offer a new job of producing paper briquettes to dumpsite waste pickers and promote them to take up it. This job of producing paper briquettes is easy to measure output of workers. We can count the amount produced by one worker per day, or even hourly. Thus, it is the job which performance pay would be the best compensation scheme. Here, the optimal compensation level is that paying 1 PHP per production of 4 pieces of paper briquettes. This is calculated by the fact that 40 pieces (approximately 1 kilogram) can be sold with 15 PHP by retail shops. Therefore, if a municipality offers this job to dumpsite waste pickers according to the optimal compensation theory, it should write down on the letter that the payment will be 1 PHP per 4 pieces. In our field experiment, this compensation level is set as the benchmark.

Although the above scheme can give an incentive to workers and raise the maximum revenue, a firm cannot raise profit. Lazear (1998) provides a scheme with a method termed *a draw* to raise profit while keeping an incentive of workers. This scheme is the mix of fixed and performance pay. Workers are guaranteed a certain

12

amount of salary (a draw) even if production falls short of the certain level. But workers receive no commission until they have produced at least that threshold level. After that production level, workers begin to earn the same rate as the above scheme. If we set the level of a draw below the level that workers would be able to earn when they produced threshold level with the pure performance pay, a firm can raise profit.

For example, if a municipality adopts the pure performance pay, it should pay (in our case) 37.5 PHP per day if a worker produced 150 pieces (150 divided by 4). Let set a draw as 30 PHP, and do not pay commission until a worker produce more than 150 pieces, and then pay 1 PHP per 4 pieces for the additional production above 150 pieces. This compensation scheme can raise profit of 7.5 PHP per worker per day if she/he produces more than 150 pieces while keeping an incentive of workers. This *performance pay with a draw* is the second compensation scheme we adopted in the field experiment.

As we discussed above, the offer needs the compensation schemes to determine the level of salary. In addition to that, we have to consider frequency of the payment. We often observe that firms pay salary once a month. On the other hand, there exist jobs with daily wage basis. For example, construction and agriculture industry often hire daily earners who are compensated by their daily work.

The job of our interest, a dumpsite waste picking, can earn cash everyday through selling recyclable waste to junk shops. Thus, we will consider the payment frequency of everyday, coupled with the scheme using the theory of optimal compensation. However, frequent payment incurs administrative cost to a municipality. Therefore, we also examined once in three days payment, which will be twice a week.

To sum up, there are at least two aspects for the compensation schemes, (i) how

to determine the level of compensation, and (ii) how often pay the compensation. Furthermore, there are considerations on the payment of bonus, or how to deal with the absence and more. But those are beyond the scope of our study. Our study examines the effect of these two aspects of the compensation schemes on the numbers of job changes using a field experiment of distributing job offer letters.

3.3 Compensation schemes and decision to take up a new job

We prepared four types of job offer letters, performance pay with once in three days payment (Group1), performance pay with a draw with once in three days payment (Group 2), fixed pay with once in three days payment (Group 3) and performance pay with everyday payment (Group 4).

Consider information that those offer letters provide to dumpsite waste pickers. We targeted waste pickers who have never experienced producing paper briquettes. Thus, all of them do not know their own productivities. Therefore, the offer of 1 PHP per 4 pieces gives high uncertainty on the level of the compensation. One's expected salary level $s_{new}(f_{new}(e))$ depends on expectation of each one and differs among waste pickers.

This uncertainty remains in the offer with a draw. A draw of 30 PHP we set is that the same amount with the lowest earnings of our samples (see the previous section). We can imagine two impacts of this compensation scheme. Since the lowest earning by waste picking is secured, they will change their expectations upward. On the other hand, since this fixed compensation of 30 PHP is not much attractive for most of waste pickers, this offer might have a signal that this new job is very hard. In this case, a draw would have a negative effect to promote a job change.

14

Fixed pay of this experiment is set to 65 PHP. 15% of the interviewed earns less than this level. In contrast to the above two offers, this offer does not give any uncertainty on the level of the compensation ($\overline{s_{new}}$). Thus, recipients will simply compare a job of dumpsite waste picking and a job of production of paper briquettes with once in three days payment. Theoretically, if more than 15% of recipient took a new job, then it implies that production of paper briquette with once in three days is attractive than dumpsite waste picking.

Next, consider frequency of the payment. Although there remains a controversy, the result of our interview survey finds the average daily earning of dumpsite waste pickers is 2.83 USD, and this is quite low compare to the minimum wage. In addition, most of them do not have personal IDs. These facts remind us that dumpsite waste pickers are in bad access to financial services and therefore in strict liquidity constraints. Thus, we can hypothesize that the frequent payment is preferred and the Group 4 attracts more than the Group 1.

On the other hand, we can hypothesize the opposite result. First, daily payment reminds them a very hard work. Frequency of the payment might send signal that this job is not attractive in terms of the compensation level or working conditions. Second, as is observed at the field experiment by Ashraf et al. (2006), some individuals in the Philippines have high discounting rate for the near term tradeoffs but low one for the future tradeoffs. And if they are sophisticated enough to realize it, then they will engage in self-commitment behavior. In such a case, as Ashraf et al. (2006) found the demand for a commitment savings product, less frequent payment would be preferred to restrict themselves from immediate consumption. Such kind of behavior is also explained by temptations model by Gul and Pesendorfer (2001, 2004). If this is the case, everyday

15

payment will be preferred over once in three days payment, and a municipality can cut down administrative cost of payment while promoting larger numbers of job changes. We tested these hypotheses by a field experiment which the design is explained in the next section.

4. Experimental design and empirical strategy

4.1 Interview survey

As is already mentioned above, we conducted interview survey of waste pickers before the distribution of job offer letters. We asked demographic questions, willingness to accept (WTA) a shutdown of the dumpsite for a month of December 2013, and also asked hypothetical risk and time preferences questions (See appendix 1 for the questionnaire sheet). The main purposes of this survey are to increase the identification power of estimation of the difference in compensation schemes, and to find out determinants of a job change decision.

From the below hypothetical question, we measure damage cost of prohibited to pick waste which is equal to the compensation level to accept the shutdown of the dumpsite,

Question: Please imagine a situation that the Calajunan dumpsite will be closed because of the construction of a new sanitary landfill, for a month December in 2013. How much per a month is enough for you to accept this policy instead of entering the dumpsite?

The respondents stated their requirement in PHP with a free answer form.

We measure risk preferences by asking waste pickers to choose between

receiving a reward for sure and receiving a reward which the amount will be determined

by chance (Binswanger 1980, Holt and Laury 2002). According to their choice, waste

pickers are categorized into 3 groups, risk seeking, neutral, and averse.

Similarly, following the literature of behavioral economics (Thaler 1981, Benzion

et al. 1989), we measure time preferences of waste pickers. We asked them to choose

between receiving a smaller reward today and receiving a larger reward with some

delay. A sample question is as follows:

There are 2 plans, A and B, offered to you. If you choose Plan A, you will receive X

PHP for sure in Y. If you choose Plan B, you will receive Z PHP today. Please tell me

the Plan you prefer.

Where X takes two values of 120 and 600, Y takes three time periods of 3 days, 2

weeks and 2 months, and Z takes the range of 20 to 500. We asked this type of 30

questions with different combinations of X, Y, and Z. Waste pickers who chose Plan A,

a future reward for all the 30 questions are defined as patient individuals. On the other

hand, those who chose Plan B, an immediate reward for all the 30 questions are defined

as impatient.

4.2 Experimental design

We conducted a field experiment at the dumpsite at Iloilo to test whether

differences in compensation schemes would change a rate of taking up a new job by

waste pickers. We proposed them a simple work of producing paper briquette fuels.

Since measuring outputs of this work is costless, we can accurately measure daily

productivity of workers involved in this new job.

On the 22th, 23th, 25th, and 26th of November 2013, we distributed envelopes

which include job offer letters to 112 waste pickers (Appendix 2 shows an English version of job offer letters. Those are translated into Ilongo, a local language.) One of our authors at the University of Tokyo and research assistants at Central Philippine University distributed the envelopes. In doing so, the vice president of the waste workers association supported us. Distribution was made by climbing up the dump hill to find waste pickers who were interviewed, and visiting their houses along the dumpsite. The offer letter is constructed by two pages. The first page is common for all the recipients. There was a job description on it. In addition, starting time, working time, and the process of applying this offered job are described. We called for workers who can join us 18 days from November 27th except for Sunday. Working hours are set to five hours from 10AM to 4PM (excluding one hour lunch break). The working place is the meeting place of the association which has a roof. We mentioned the vacancies are "more than 16." Finally, it is mentioned that those who wanted to take up our offer should attend the orientation held on November 27th.

The second page of the job offer letter differs among recipients. Four different types of the second pages are attached following the first page in Appendix 2. The compensation scheme of the first group is pure performance pay of 1 PHP per 4 pieces of production. The payment will be done once in three days (twice a week). On the other hand, the compensation scheme of the group 2 (*Performance pay with a draw*) differs in how to determine the level of salary. It proposed "Fixed pay 30 PHP per day. If you successfully produce 150 pieces per day, you will be paid a bonus. A bonus: 1 PHP per 4 pieces for paper briquettes which you additionally produce more than 150 pieces." The group 3 (*Fixed pay*) is proposed a fixed pay of 65 PHP per day. Finally, the group 4 (*Everyday payment*) is proposed pure performance pay of 1 PHP per 4

pieces with the payment of everyday. Table I summarize these compensation schemes.

[Table I Here]

Process of distribution of the offer letter was as follows. First, we find a waste picker who was interviewed in August. Second, we shuffle the four cards and show them with faces down to a waste picker. Third, she/he will pick up one card. Finally, the type of job offer letter is determined by the number of the card she/he chose. Only one type of offer letter among four types is given to one waste picker. Those who received the offer letter will read it and decide whether continue the present job of waste picking or take up an offer.

We used the meeting place of the association as the basement place and always started from there to search interviewed waste pickers. This introduces a bias in the sample selection toward waste pickers who often work near the meeting place or living near it. Summary statistics of all the interviewed, total recipients of the letter, and randomly divided four groups of waste pickers are shown in Table II.

[Table II Here]

Those who decided to take up the offered job are required to attend the orientation. In the orientation, we explained about the job in detail, demonstrated how to produce paper briquettes, and noticed about the compensation scheme for each. We defined the one who attended this orientation and continued to work on this job for three weeks as an individual who take up the new job and stopped picking waste. Those who changed a job started producing paper briquettes from November 28 and then received compensation according to their production and the scheme which is determined randomly among four types.

4.3 Empirical strategy

The outcome variable of interest is take up of our job offer (C) by waste pickers.

Let C_i be an indicator variable for take up the job offer. Let D_{draw} be an indicator

variable for receiving an offer letter of group 2 which is performance pay with a draw.

Similarly, D_{fp} be a group 3 which is a fixed pay and D_{every} be a group 4 which is

performance pay with everyday payment. Then, we estimate the equation (1) using a

logit model to examine effects of different compensation schemes on leaving the

present job and taking up a new job.

$$C_i = \beta_{draw}D_{draw,i} + \beta_{fp}D_{fp,i} + \beta_{every}D_{every,i} + \gamma X_i + \epsilon_i, \tag{1}$$

where X_i is a vector of demographic and other survey responses and ε_i is an error

term for individual i. Adding covariates X_i makes the standard errors of estimated β

smaller, and increases the power of identification of the effects. If β is positive and

statistically significant, it means that compensation scheme can promote more job

changes compare to the group 1 which is performance pay with once in three days

payment. On the other hand, if β is negative, it means that compensation scheme does

not have any positive impact and is not attractive than the group 1.

5. Results

In this section we present estimates of the impact of different compensation

schemes on taking up the new job.

5.1 Descriptive results

Seventeen waste pickers applied to the offered job and joined the paper briquettes

production for three weeks in December 2013. This is 15% of waste pickers who received the offer letter. Thus, this means we could not induce job change of 85% of rest of them. Those kept working at the dumpsite.

The offer with performance pay with once in three days payment attracted 27% of those who received this offer. This implies even an offer with a highly uncertain level of salary and less frequent income flow compare to the present job, we could promote more than quarter of waste pickers to change their job. Also, the offer of performance pay with a draw attracted quite a few applicants of 23%.

The offer with a fixed pay of 65 PHP per day attracted 18% of recipients. This is slightly lower than 20.6% which is the share of waste pickers received this offer and whose daily earning are less than 65 PHP. Surprisingly, however, all the 4 applicants from this group earn more than 65 PHP by picking waste. Even two of them earn more than double of offered wage rate (150 PHP). We believe this result implies bad working condition of waste picking. In addition, this is the evidence that surely some fraction of them are seeking for a job opportunity.

The worst one was the offer of performance pay with everyday payment. This offer attracted only 9% of the recipients. We will discuss explanations for this result in the next subsection.

5.2 Impact of different payment schemes

We estimate the effect of changing a compensation scheme on the number of applicants to the new job. Table III displays descriptive statistics of the independent variables. Table IV shows the estimation results of equation (1) using a logit specification.

[Table III Here]

[Table IV Here]

First, we could not find any positive nor negative effect of a draw of 30 PHP until 150 pieces. A 30 PHP payment for sure could not attract waste pickers. But this means even though the level of fixed compensation rate per day is very low, waste pickers did not take this draw as a sign of hard work. Therefore, using this technique of a draw, the municipality can raise a profit of 7.5 PHP per day per worker without reducing the number of job changes.

Second, waste pickers who received fixed pay of 65 PHP per day offer are less likely to take up a new job compare to the performance pay offer. The estimates are statistically significant in the model (2) and (3). Our interpretation of this result is that our offer of pure performance pay gave waste pickers an expectation of more than 65 PHP per day on average. We cannot identify why this occurred, but even though the offer is highly uncertain on the compensation level, they took this job would give us more than 65 PHP which is about a half of the average earning of waste pickers.

Finally, we found significant and robust evidences of negative effect of making a payment frequency to everyday from once in three days. Waste pickers who received this everyday payment with uncertain compensation level offer are less likely to take up our proposed job. This suggests that a new job with everyday payment which is same as the current job seems not attractive for them. Perhaps one might consider our job is very hard in working condition and is not secured employment since jobs with everyday payment often have such a feature. Another explanation on this result is the temptation model (Gul and Pesendorfer 2001, 2004). A previous study also found a similar behavior of individuals. Ashraf et al. (2006) found individuals with hyperbolic time

22

preference are more likely to take up a self-commitment saving account from the natural field experiment in the Philippines. There were individuals who restrict withdrawals from their account until a certain targeted time period. This implies that some individuals recognize that they are impatient for a short-term but their welfare will be enhanced with larger savings in the future, and are sophisticated enough to realize restricting themselves will improve welfare in the long-term. If this is true for waste pickers, they will prefer once in three days payment over everyday. They might know that they would spend a daily income too much, if they receive it everyday.

However, this result does not imply the less frequent payment is always better. We believe this was the case for our experiment since the less frequent offer is once in three days which is more frequent than common payment practice of once a month. Further studies are needed to examine the most attractive payment frequency for waste pickers. In addition, we need more detailed experiment to find out the actual reason why they prefer once in three days compare to everyday.

5.3 Demographic and psychological determinants of a job change

The results of the models (2) – (5) on Table IV give us other determinants of taking up our offered job. Age and education are uncorrelated with a job change. Transaction relationship with the association ("Selling to the association") revealed positive and highly significant effect on taking a new job. This makes sense since the association indeed supported our recruiting and it provided us a working place for the new job. This evidence of strong bond between waste pickers and a buyer is also shown in the previous studies (Hayami et al. 2006, Gill 2007).

We find females are more likely to take up a new job. A negative sign of "no

23

other worker in the household (HH)" mentions that waste pickers who are the only one earning within a family are less likely to leave the dumpsite and work at the new job. Combination of these two results implies that a main person of household income is more likely to stay at the current business. The reason we believe is that our offer was highly uncertain for earnings (except for the fixed pay offer) so that the individual who is responsible for the base income of a household hesitated to take up this risky offer. This means we failed to promote a job change of those individuals and we believe they are the main opponents of a new waste management policy. This leaves us a future task to promote such kind of individuals to stop waste picking and take an alternative job.

We find risk averse waste pickers are less likely to take up a new job. Patient waste pickers are more likely to change a new job. Waste pickers who stated higher compensation for willingness to accept shutdown are less likely to take up an offer and therefore prefer to stay at the dumpsite.

6. Conclusion

Environmental policies often enforce job changes to workers in a certain industry. Naturally enough, the workers oppose such policies. In order to implement an environmental policy without conflicts, a municipality has to prepare job opportunities, and then promote workers to take up it given that job.

We conducted a field experiment in the Philippines to promote job changes of dumpsite waste pickers who would suffer from an environmental policy with offering a new job of producing paper briquettes fuels. We prepared four types of job offer letters

to examine impacts of the different compensation schemes on the decision of take up a new job.

We could promote only 15% of dumpsite waste pickers to take up an offered job. Even the most successful offer could attract only 27% of the recipients. In general, waste pickers are considered as poor and a situation of unemployment. Taking this fact into account, our experiment found that not many of them are requiring a job opportunity. In addition, we observed 75% of applicants were female. These results tell us that promoting a job change of dumpsite waste pickers are very difficult, especially for male.

We found that, surprisingly, once in three days payment scheme can attract more applicants than everyday payment. We conjecture that the offer with everyday payment might send signal of not attractive job. Otherwise, this might be the case that dumpsite waste pickers are obtaining earnings for everyday and they recognize that they are facing temptation to consume too much because of the daily cash flow. Perhaps, they wish to restrict themselves by receiving the payment less frequently. Similar behavior is observed in the natural field experiment in the Philippines by Ashraf et al. (2006), and this can support temptation models by Gul and Pesendorfer (2001, 2004).

This finding suggests that we do not need to pay everyday to stop them to picking waste as they are earning right now. Rather, the everyday payment offer has an effect to decrease the numbers of take up a new job. Municipalities should provide an offer with once in three days payment instead of everyday in order to attract more workers. However, our study does not mean less frequent always attracts more applicants. Further studies and experiments are needed to find the optimal frequency of the payment.

Another finding is that we could promote around 25% of targeted workers to take up a new job even with a highly uncertain level of the compensation. A certain fraction of dumpsite waste pickers would take up a new job no matter the level of compensation is obvious. We did not find any positive or negative effect of adding a draw of the fixed compensation on performance pay. We have to admit that our sample size is not large enough so that there is a possibility we could not identify the effect. Further studies may reveal what kind of compensation schemes would promote a job change of dumpsite waste pickers as many as possible, raise profit of a municipality, and motivate workers at the same time.

References

Agunwamba, J. C. 2003. "Analysis of Scavengers? Activities and Recycling in Some Cities of Nigeria." *Environmental Management*, 32(1), 116-27.

Ashraf, N.; D. Karlan and W. Yin. 2006. "Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines." *Quarterly Journal of Economics*, 121(2), 635-72.

Asim, Muhammad; Syeda Adila Batool and Muhammad Nawaz Chaudhry. 2012. "Scavengers and Their Role in the Recycling of Waste in Southwestern Lahore." *Resources, Conservation and Recycling*, 58, 152-62.

Benzion, U.; A. Rapoport and J. Yagil. 1989. "Discount Rates Inferred from Decisions - an Experimental-Study." *Management Science*, 35(3), 270-84.

Binswanger, H. P. 1980. "Attitudes toward Risk - Experimental-Measurement in Rural India." *American Journal of Agricultural Economics*, 62(3), 395-407.

Gill, Kaveri. 2007. "Interlinked Contracts and Social Power: Patronage and Exploitation in India's Waste Recovery Market." *Journal of Development Studies*, 43(8), 1448-74.

Gul, F. and W. Pesendorfer. 2004. "Self-Control and the Theory of Consumption." *Econometrica*, 72(1), 119-58.

____. 2001. "Temptation and Self-Control." *Econometrica*, 69(6), 1403-35.

Gutberlet, J. and A. M. Baeder. 2008. "Informal Recycling and Occupational Health in Santo Andre, Brazil." *Int J Environ Health Res*, 18(1), 1-15.

Hayami, Yujiro; A. K. Dikshit and S. N. Mishra. 2006. "Waste Pickers and Collectors in Delhi: Poverty and Environment in an Urban Informal Sector." *Journal of Development Studies*, 42(1), 41-69.

Holt, C. A. and S. K. Laury. 2002. "Risk Aversion and Incentive Effects." *American*

Economic Review, 92(5), 1644-55.

Lazear, Edward P. 1995. *Personnel Economics*. Massachusetts Institute of Technology.

____. 1998. *Personnel Economics for Managers*. New York: Wiley.

Medina, M. 1998. "Border Scavenging: A Case Study of Aluminum Recycling in Laredo, Tx and Nuevo Laredo, Mexico." *Resources Conservation and Recycling*, 23(3), 107-26.

____. 2000. "Scavenger Cooperatives in Asia and Latin America." *Resources Conservation and Recycling*, 31(1), 51-69.

____. 2007. *The World's Scavengers: Salvaging for sustainable Consumption and Production*. Globalization and the Environment Series, AltaMira Press.

Nzeadibe, Thaddeus Chidi. 2009. "Solid Waste Reforms and Informal Recycling in Enugu Urban Area, Nigeria." *Habitat International*, 33(1), 93-99.

Paul, J. G.; J. Arce-Jaque; N. Ravena and S. P. Villamor. 2012. "Integration of the Informal Sector into Municipal Solid Waste Management in the Philippines--What Does It Need?" *Waste Manag*, 32(11), 2018-28.

Sasaki, Shunsuke and Tetsuya Araki. 2013. "Employer–Employee and Buyer–Seller Relationships among Waste Pickers at Final Disposal Site in Informal Recycling: The Case of Bantar Gebang in Indonesia." *Habitat International*, 40, 51-57.

Thaler, R. 1981. "Some Empirical-Evidence on Dynamic Inconsistency." *Economics Letters*, 8(3), 201-07.

Tirado-Soto, M. M. and F. L. Zamberlan. 2013. "Networks of Recyclable Material Waste-Picker's Cooperatives: An Alternative for the Solid Waste Management in the City of Rio De Janeiro." *Waste Manag*, 33(4), 1004-12.

Wilson, D. C.; A. O. Araba; K. Chinwah and C. R. Cheeseman. 2009. "Building

Recycling Rates through the Informal Sector." *Waste Manag*, 29(2), 629-35.

Wilson, David C.; Costas Velis and Chris Cheeseman. 2006. "Role of Informal Sector Recycling in Waste Management in Developing Countries." *Habitat International*, 30(4), 797-808.

Table I Compensation schemes of the four groups

	Group 1	Group 2	Group 3	Group 4
Way to determine compensation level	Performance pay	Performance pay with a draw	Fixed pay	Performance pay
	1 PHP per 4 pieces of production	A draw of 30 PHP per day, and 1 PHP per 4 pieces of additional production of more than 150 pieces	65 PHP per day	1 PHP per 4 pieces of production
Frequency of the payment	Once in three days			Everyday

Table II Means and standard deviations of variables by groups

	All the interviewed	Recipient of the letter	Group 1	Group 2	Group 3	Group 4
Female	0.521	0.500	0.500	0.536	0.471	0.500
	(0.501)	(0.502)	(0.512)	(0.508)	(0.507)	(0.509)
Age (years)	34.858	34.616	33.364	35.929	34.941	33.893
	(12.858)	(12.360)	(12.700)	(13.378)	(13.412)	(10.005)
Education (years)	7.004	7.246	7.114	7.321	7.147	7.393
	(2.825)	(2.692)	(2.600)	(2.389)	(2.893)	(2.923)
Daily earning by waste picking (PHP)	123.803	131.938	137.364	139.107	119.706	135.357
	(67.272)	(69.863)	(59.270)	(67.824)	(74.233)	(75.632)
Daily working time of waste picking (hours)	6.891	6.982	7.136	6.750	7.147	6.893
	(1.871)	(2.022)	(2.232)	(1.818)	(2.148)	(1.969)
Selling to the association	0.329	0.348	0.227	0.357	0.382	0.393
	(0.471)	(0.479)	(0.429)	(0.488)	(0.493)	(0.497)
No other worker in the HH	0.267	0.196	0.136	0.214	0.206	0.214
	(0.443)	(0.399)	(0.351)	(0.418)	(0.410)	(0.418)
No other job	0.642	0.688	0.636	0.714	0.735	0.643
	(0.481)	(0.466)	(0.492)	(0.460)	(0.448)	(0.488)
Willingness to join	0.900	0.920	0.909	0.964	0.971	0.821
	(0.301)	(0.273)	(0.294)	(0.189)	(0.171)	(0.390)
Risk seeking	0.063	0.080	0.000	0.143	0.029	0.143
	(0.243)	(0.273)	(0.000)	(0.356)	(0.171)	(0.356)
Risk averse	0.438	0.402	0.409	0.321	0.471	0.393
	(0.497)	(0.492)	(0.503)	(0.476)	(0.507)	(0.497)
Impatient	0.167	0.152	0.045	0.286	0.088	0.179
	(0.373)	(0.360)	(0.213)	(0.460)	(0.288)	(0.390)
Patient	0.079	0.089	0.227	0.071	0.000	0.107
	(0.271)	(0.286)	(0.429)	(0.262)	(0.000)	(0.315)
WTA to accept (PHP)	5368.085	5541.284	5568.182	5535.714	5909.091	5057.692
	(3117.644)	(3016.259)	(2331.439)	(2899.325)	(3694.283)	(2786.851)
Sample size	240	112	22	28	34	28

Standard deviations are listed in parentheses below the means.

Table III Summary statistics

	Mean	Standard deviation	Minimum	Maximum
Performance pay with a draw	0.250	0.435	0	1
Fixed pay	0.304	0.462	0	1
Everyday payment	0.250	0.435	0	1
Female	0.500	0.502	0	1
Age (years)	34.616	12.360	18	68
Education (years)	7.246	2.692	0	13
Daily earning by waste picking (PHP)	131.938	69.863	30	400
Daily working time of waste picking (hours)	6.982	2.022	1	11
Selling to the association	0.348	0.479	0	1
No other worker in the HH	0.196	0.399	0	1
No other job	0.688	0.466	0	1
Willingness to join	0.920	0.273	0	1
Risk seeking	0.080	0.273	0	1
Risk averse	0.402	0.492	0	1
Impatient	0.152	0.360	0	1
Patient	0.089	0.286	0	1
WTA to accept (PHP)	5541.284	3016.259	1000	20000

$N = 112$. Note that "WTA to accept" has only 109 observations.

Table IV-1 Logit estimation results on taking up a new job

	(1)	(2)	(3)	(4)	(5)
Performance pay with a draw	-0.5452	-0.9735	-1.0009	-0.8518	-0.9891
	[0.6875]	[0.7747]	[0.8292]	[0.9438]	[0.9739]
Fixed pay	-1.0341	-1.4136*	-1.4793*	-1.2646	-0.8914
	[0.7159]	[0.8139]	[0.8635]	[0.9656]	[1.0288]
Everyday payment	-1.5841*	-2.1582**	-2.2883**	-2.0971*	-2.7981**
	[0.8761]	[0.9709]	[1.0219]	[1.0930]	[1.2722]
Female		1.5440**	1.7199**	2.1488**	3.0412***
		[0.7000]	[0.7888]	[0.8912]	[1.1303]
Age		0.0075	0.0108	0.0048	0.0356
		[0.0262]	[0.0299]	[0.0311]	[0.0348]
Education		0.0251	-0.0067	0.0006	0.0265
		[0.1139]	[0.1195]	[0.1310]	[0.1399]
Daily earning by waste picking		0.0035	0.0059	0.0089	0.0207**
		[0.0050]	[0.0055]	[0.0061]	[0.0089]
Daily working time of waste picking		-0.1091	-0.1357	-0.2150	-0.2413
		[0.1647]	[0.1767]	[0.2015]	[0.2079]
Selling to the association		1.5901**	1.7844***	2.0755***	2.7833***
		[0.6446]	[0.6872]	[0.7837]	[0.9172]
No other worker in the HH			-1.6696	-1.8898	-2.3979*
			[1.1789]	[1.3188]	[1.4485]
No other job			-0.3734	-0.9871	-1.1859
			[0.8142]	[0.9454]	[1.0033]
Willingness to join			0.7353	0.6056	1.3024
			[1.3685]	[1.4116]	[1.4969]
Risk seeking				-0.0602	-0.1371
				[1.4840]	[1.5482]
Risk averse				-1.3038	-1.5918*
				[0.8143]	[0.9218]
Impatient				0.3750	0.9992
				[0.8946]	[0.9860]
Patient				1.6684	2.6267*
				[1.1851]	[1.4100]
WTA to accept					-0.0003**
					[0.0001]
Constant	-0.9808**	-2.4864	-2.8822	-2.3850	-4.8595
	[0.4787]	[2.1510]	[2.7154]	[2.8159]	[3.2669]
Observations	112	112	112	112	109
Log-likelihood	-45.55	-38.76	-37.05	-34.85	-31.88
Wald χ squared	4.279	17.85	21.28	25.68	30.61
Pseudo R squared	0.0449	0.1871	0.2232	0.2693	0.3243

Coefficients are reported. Standard errors are in parentheses.

*** Indicates statistically significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Table IV-2 Marginal effects of the model (3)

| | Marginal Effects | | | |
	(3-1)	(3-2)	(3-3)	(3-4)
Performance pay with a draw	-0.0744	**-0.158**	-0.139	-0.128
	(0.0624)	**(0.153)**	(0.143)	(0.135)
Fixed pay	-0.110*	-0.233	**-0.206**	-0.189
	(0.0650)	(0.180)	**(0.147)**	(0.154)
Everyday payment	-0.170**	-0.361	-0.318	**-0.292***
	(0.0755)	(0.224)	(0.201)	**(0.171)**
Observations	112	112	112	112

(3-1) Marginal effects are calculated given that all the variables are set to their mean values.

(3-2) Marginal effects are calculated given that (Fixed pay = 0) and (Everyday payment = 0).

(3-3) Marginal effects are calculated given that (Performance pay with a draw = 0) and (Everyday payment = 0).

(3-4) Marginal effects are calculated given that (Performance pay with a draw = 0) and (Fixed pay = 0).

The rest of variables are set to their mean values for (3-2), (3-3) and (3-4).

Standard errors in parentheses. *** Indicates statistically significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Appendix 1. Survey sheet of interview survey

The Survey on Living Standards and Opinions for a New Job

inat Calajunan, Iloilo City

The University of Tokyo and Central Philippine University

****

This section should be completed by the interviewer BEFORE starting the interview.

Date of interview (ddmmyy) _____

The starting time _____ : _____AM/PM

Interviewed by _____

Respondent name_____

Sex _____ 1.Male 2.Female

Date checked (ddmmyy) _____

Checked by _____

Date entered (ddmmyy) _____

Data entered by _____

Contacts

Followings are the contact details.

1. Project Manager: Maki IKUSE

Department of International Studies, the University of Tokyo

E-mail: maki.utokyo.cpu@xxxxx.com

Mobile phone: 099XXXXXXXXX

2. Project Director: Hide-Fumi YOKOO

Department of International Studies, the University of Tokyo

3. Co-investigator: Aries Roda D. ROMALLOSA

Department of Agricultural Engineering and Environment

Management, Central Philippine University

STARTING UP

Introduction of this interview survey to the respondent based on the items below

(1) The objective

(2) The protection of personal information

(3) The reward (no payment)

(4) The contents

TIPS!

☑The target respondent should be a waste-picker who do NOT have alternative livelihood.

☑The "ID:_____" upper right should be always finished inputting by Maki.

☑Your way of entering the answers should be followed below.

How to enter the answer

Answer given the choices	The number of the choice (s)
Free answer (Numerical quantity)	The answer (No change)
Free answer (Description)	The answer translated in English
Rejected answer	N.A.
Skipped answer	(Slash)

【1】 Questions regarding SOCIO-DEMOGRAPHICS (D1~)

Member Codes	D1 Please provide the full name of each household member (that is a person who shares income and expenditure).	D2 Relation to respondent See Codes (D2)	D3 Sex **1.Male** **2.Female**	D4 How old is [member]? **Free answer**	D5 Marital status See Codes (D5)	D6 Is [member] earning for your family ? **1.Yes** **2.No**	D7 Years of education See reference (D7)
1	**Respondent**						
2							
3							
4							
5							
6							
7							
8							
9							
10							

Relation Codes (D2)
1=Spouse
2=Children
3=Parent
4=Grand child
5=Grandparent
6=Brother/Sister
7=Nephew/Niece
8=Other relative
9=Other non-relative

Marital Codes (D5)
1=Single
2=Married
3=Divorced
4=Widow/Widower
5=Separated

Reference (D7)
Elementary school:6 years
High school: 4 years
College: 4 years

Member Codes	D1 Please provide the full name of each household member (that is a person who shares income and expenditure).	D2 Relation to respondent See Codes (D2)	D3 Sex 1.Male 2.Female	D4 How old is [member]? Free answer	D5 Marital status See Codes (D5)	D6 Is [member] earning for your family ? 1.Yes 2.No	D7 Years of education See reference (D7)
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Relation Codes (D2)
1=Spouse
2=Children
3=Parent
4=Grand child
5=Grandparent
6=Brother/Sister
7=Nephew/Niece
8=Other relative
9=Other non-relative

Marital Codes (D5)
1=Single
2=Married
3=Divorced
4=Widow/Widower
5=Separated

Reference (D7)
Elementary school:6 years
High school: 4 years
College: 4 years

No.	Questions	Options	ResponseAnswers
D8	Do you live at Calajunan now?	1.Yes 2.No (>>D8-2)	>>D8-1a
	If the answer of D8 is 1.Yes…		
D8-1a	How long have you lived at Calajunan?		(years)
D8-1b	Have you ever lived in the place anywhere other than Calajunan?	1.Yes 2.No	
	If the response of D8-1b is 1.Yes…		
D8-1b1	Where is the place?	See Codes (D8-1b1)	
	If the response of D8 is 2.No…		
D8-2	Where is the place?	See Codes (D8-2)	
D9	What is the type of your housing?	1.Bamboo 2.Paper 3.Wood 4.Concrete 5.Others	If "5.Other", describe it.

**Residence Codes
(D8-1b1, D8-2)**

1=Mandurriao
(Other than Calajunan)
2=Jaro
3=Lapaz
4=Molo
5=Arevalo
6=The City Proper
7=Outside Iloilo City

【2】 Questions regarding WASTE-PICKING (WP)

No.	Questions	Options	Answers
WP1	How many years do you worked on waste-collection?		(years)
WP2	What motivated or triggered you to waste-collection?	Free answer.	
WP3	How many kg of recyclables do you collect **per day** on average with waste-collection?		(kg)
WP4	How much do you earn **per day** on average with waste-collection?		(PHP)
WP5	How much do you earn **per month** on average with waste-collection?		(PHP)
WP6	How many hours do you work **per day** on average with waste-collection?		(hours)
WP7	How many days do you work **per month** on average with waste-collection?		(days)
WP8	To which junk shop do you usually sell his/her recyclable wastes?	See Code (WP8) **Multiple choices**	If "6=Others", describe it.

Junk Shop Codes (WP8)

1=UCLA

2=MGB

3= Mr. Segovia's Junk Shop

4=Mr. Rosheen's Junk Shop

5=Mr. Hero's Junkshop

6=Others

【3】 Questions regarding WORK EXPERIENCES (WE)

No.	Questions	Options	Answers
WE1	Do you have any other job besides waste-picking <u>right now</u>?	1.Yes 2.No	>>WE1a
	If the answer of WE1 is 1.Yes…		
	WE1a What kind of work is it?	Free answer	
WE2	Did you have any other job besides waste-picking <u>in the past</u>?	1.Yes 2.No	>>WE2a
	If the answer of WE2 is 1.Yes…		
	WE2a What kind of work was it?	Free answer	

【4】 Questions regarding WILLINGNESS TO ACCEPT (WTA)

Show the cited photo for this question to the respondent.

(Interviewer)

In this section, I would like you to assume a certain situation that is <u>NOT real.</u> Please listen to what I tell you carefully and answer some questions later.

Please imagine a situation that the Calajunan dumpsite will be closed because of the construction of a new sanitary landfill, for a month December in 2013. An entrance into the dumpsite will not be permitted for a month. This means that earning money from collecting recyclables will become difficult for you. Therefore, the University of Tokyo considers compensating you for the reasonable amount of income during the one month.

Cited Photos

No.	Questions	Options	Answers
WTA1	Do you agree or disagree on this policy?	1.Agree 2.Disagree 3.No opinion	
WTA2	Please give me your reason for your opinion.	Free answer	
WTA3	How much <u>per a month</u> is enough for you to accept this policy instead of entering the dumpsite?	Free answer (No limitation for the answer)	(PHP) for a month

【5】 Choice Experiment I for STATED RISK PREFERENCE (SRP)

Prepare a set of cards for this choice experiment BEFORE the start.

◆**Introduction**

(Interviewer)　In this game, your earnings will depend partly on your decisions and partly on chance. There are 8 questions. I will offer you two plans: Plan A and Plan B. I would like you to choose either Plan A or Plan B for each question.

If you choose Plan A, your earning will be the amount given in Plan A. If you choose Plan B, your earning will be one of the two values given in the Plan B. The value will be decided by my flipping a coin. Let's practice with Question 1 as an example.

Example　　　　　　　　　　**Show the example to the respondent**

(Interviewer)

　　　　　- For No.1, if you choose the card A, you will receive 500PHP for sure.

・- If you choose the card B, you will flip a coin. If it is heads, you will receive 750PHP. If it is tails, you will receive 50PHP.

・- Please tell me which you prefer.

※Circle the answers below

No. of Qs	A		B				Answer
1	500　PHP		750　PHP	or	50　PHP		A　・　B
2	500　PHP	or	750　PHP	or	300　PHP		A　・　B
3	500　PHP		750　PHP	or	500　PHP		A　・　B

※Repeat the same steps for No.2 and No.3

Ask the respondent whether they have unclear points or parts to be explained more or not.

If the respondent fully understand the rule and he/she can do the further choice experiment, go to the main game.

Main game

Circle the answer

※

No. of Qs	A		B					Answer		
1	500	PHP		750	PHP	or	50	PHP	A ·	B
2	500	PHP		750	PHP	or	150	PHP	A ·	B
3	500	PHP		750	PHP	or	200	PHP	A ·	B
4	500	PHP	or	750	PHP	or	300	PHP	A ·	B
5	500	PHP		750	PHP	or	350	PHP	A ·	B
6	500	PHP		750	PHP	or	400	PHP	A ·	B
7	500	PHP		750	PHP	or	450	PHP	A ·	B
8	500	PHP		750	PHP	or	500	PHP	A ·	B

※*After the respondent finishes answering, confirm the answers whether they are correct or not.*

-------------------Short break for 2 minutes -------------------

【6】 Choice Experiment Ⅱ for STATED DISCOUNTING RATE (SDR）

Prepare a set of the handouts for this choice experiment BEFORE the start.

◆**Introduction**

(Interviewer)   In this game, you will receive money either today or sometime in the future, depending on the choices you make. There are 30 questions. In each question, we will offer you two plans: Plan A and Plan B. We would like you to choose either Plan A or Plan B for each question. Let's practice the Question 1 in the example.

※*Show the example to the respondent.*

Example

(Interviewer)   There are 2 plans, A and B, offered to you. If you choose Plan A, you will receive 500 PHP for sure in 1 week. If you choose Plan B, you will receive 80PHP today. Please tell me the Plan you prefer.

Circle the answers

No. of Qs	A					B			Answer		
1	600	PHP	in	1 week		80	PHP	Today	A	·	B
2	600	PHP	in	1 week	or	240	PHP	Today	A	·	B
3	600	PHP	in	1 week		400	PHP	Today	A	·	B

※*Go to the next Question and repeat the same step as Question1.*

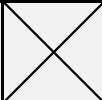※*Repeat the same steps for No.2 and No.3.*

Ask the respondent whether they have unclear points or parts to be explained more or not.

If the respondent fully understand the rule and he/she can do the further choice experiment, go to the main game.
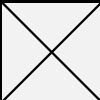
Main game Set 1

Circle the answer

No. of Qs	A					B			Answer		
1	120	PHP	in	3 days		20	PHP	Today	A	·	B
2	120	PHP	in	3 days		40	PHP	Today	A	·	B
3	120	PHP	in	3 days	or	60	PHP	Today	A	·	B
4	120	PHP	in	3 days		80	PHP	Today	A	·	B
5	120	PHP	in	3 days		100	PHP	Today	A	·	B

Main game Set 2
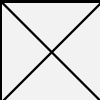
Circle the answer

No. of Qs	A					B			Answer		
1	120	PHP	in	2 weeks	or	20	PHP	Today	A	·	B
2	120	PHP	in	2 weeks		40	PHP	Today	A	·	B
3	120	PHP	in	2 weeks		60	PHP	Today	A	·	B
4	120	PHP	in	2 weeks		80	PHP	Today	A	·	B
5	120	PHP	in	2 weeks		100	PHP	Today	A	·	B
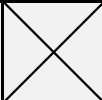
Main game Set 3

Circle the answer

No. of Qs	A					B			Answer		
1	120	PHP	in	2 months		20	PHP	Today	A	・	B
2	120	PHP	in	2 months		40	PHP	Today	A	・	B
3	120	PHP	in	2 months	or	60	PHP	Today	A	・	B
4	120	PHP	in	2 months		80	PHP	Today	A	・	B
5	120	PHP	in	2 months		100	PHP	Today	A	・	B
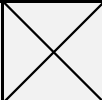
Main game Set 4

Circle the answer

No. of Qs	A					B			Answer		
1	600	PHP	in	3 days	or	100	PHP	Today	A	·	B
2	600	PHP	in	3 days		200	PHP	Today	A	·	B
3	600	PHP	in	3 days		300	PHP	Today	A	·	B
4	600	PHP	in	3 days		400	PHP	Today	A	·	B
5	600	PHP	in	3 days		500	PHP	Today	A	·	B
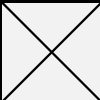
Main game Set 5

Circle the answer

No. of Qs	A					B			Answer		
1	600	PHP	in	2 weeks	or	100	PHP	Today	A	·	B
2	600	PHP	in	2 weeks		200	PHP	Today	A	·	B
3	600	PHP	in	2 weeks		300	PHP	Today	A	·	B
4	600	PHP	in	2 weeks		400	PHP	Today	A	·	B
5	600	PHP	in	2 weeks		500	PHP	Today	A	·	B

Main game Set 6

Circle the answer

No. of Qs	A					B			Answer		
1	600	PHP	in	2 months		100	PHP	Today	A	・	B
2	600	PHP	in	2 months		200	PHP	Today	A	・	B
3	600	PHP	in	2 months	or	300	PHP	Today	A	・	B
4	600	PHP	in	2 months		400	PHP	Today	A	・	B
5	600	PHP	in	2 months		500	PHP	Today	A	・	B

【7】 Questions regarding PAPER BRIQUETTES (PB)

No.	Questions	Options	Answers
PB1	Do you know "Paper briquettes"?	See Code (PB1)	
PB2	Do you know the job of producing "Paper briquettes" that UCLA offers to waste-pickers?	See Codes (PB2)	Interpret the answer.

Show the cited photo of briquettes to the respondent.

No.	Questions		Options	Answers
PB3	Do you want to join the job of producing "Paper briquettes"?		1.Yes 2.No	
	If the response of PB3 is 2.No…			
	PB3a	Why do you think so?	Free answer	
PB4	What fuels do you use for cooking at home?		See Codes (PB4)	If "6=Others", describe it.
PB5	There are UCLA members engaged in the production of "Paper briquettes." How close are you with them?		See Codes (PB5)	Interpret the answer.

Knowledge Codes (PB1, PB2)
1=Do know very much
2=Do know
3=No opinion
4=Do not know well
5=Do not know at all

Fuel-type Codes (PB4)
1=Charcoal
2=Wood
3=LPG
4=Briquettes
5=Electricity
6=Others

Closeness Codes (PB5)
1=Very close
2=Close
3=No opinion
4=Not very close
5=Not close at all

【8】 Questions regarding COMMUNITY NETWORK (CN)

No.	Questions		Options	Answers
CN1	Do you have a mobile phone?		1.Yes 2.No	
	If the response of CN1 is 1.Yes…			
	CN1a	If it is acceptable for you, please tell your number.		
	CN1b	Who is the person you frequently contacted last month through mobile phone?	See Codes (CN1b)	If "7=Others", describe it.
	CN1c	Where does the person (CN1b) live now?	See Codes (CN1c)	
	CN1d	Who is the second person you frequently contacted last month through mobile phone?	See Codes (CN1d)	If "7=Others", describe it
	CN1e	Where does the person (CN1d) live now?	See Codes (CN1e)	
CN2	How many days do you go to the city proper in a week on average?		1. 0 day (Do not go) 2. 1-2 days 3. 3-4 days 4. 4-5 days 5. 7days (Everyday)	

A calling partner Codes (CN1b, CN1d)

1=Spouse
2=Children
3=Parent
4=Other relative
5=Friend
6=Business associate
7=Others

Residence of a calling partner Codes (CN1c. CN1e)

1=in Mandurriao
2=in Iloilo city other than Mandurriao
3=in Panay island other than Iloilo city
4=Manila
5=Cebu
6=in the Philippines other than above area
7=Foreign country

Appendix 2. Job offer letters

JOB OPPOTUNITY
~Paper Briquette Producer~

Background
The University of Tokyo and Central Philippine University (CPU) will conduct an alternative livelihood project of producing paper briquettes for the people living in Calajunan, Iloilo city. Now we are looking for the following people who will participate in this project.
Job description
You will be tasked to produce paper briquettes with machines which were developed by CPU. The all materials and the equipment needed for the production will be provided by us. Technical staffs who instruct how to use the machines will be with you and support you everyday.
Working Patterns
■Monday - Saturday from 27th November to 18th December, 2013 for 16 days ■Duty hours: 5 hours from 10 am to 4 pm (including 1 hour for lunch time)

Working Place	Number of vacancies
Uswag Calajunan Livelihood Association Center	More than 16 people

Requirement
■Attendance for an orientation for the project on 27th. ■Open-minded or friendly. Both of male and female, old and young are welcome.
Flow of the application and after-the application
Application Period From 21th Nov 2013 to 26th Nov 2013 ↓ An orientation for participants 27th Nov, 2013 ↓ The production of Paper briquettes From 27th Nov 2013 to 18th Dec 2013.
How to apply?
Please fulfill the following application form and submit it at the fixed place in UCLA center until 26th November.

WHY DON'T YOU JOIN PAPER BRIQUETTE PRODUCTION?

■Allowance

· 1 PHP per 4 pieces of paper briquettes

* Your salary will depend on the amount of your production.

· Payment will be done twice a week.

*You will be paid your salary for 3 days on every Wednesday and Saturday

Contact:

(1) Maki Ikuse (Project Manager)

The University of Tokyo, Japan

Email: maki.utokyo.cpu@xxx.com   Tel:09-XXXXXXXXX

(2) Professor Aries Roda D. Romallosa (Co-investigator)

Central Philippine University, Jaro, Iloilo City 5000

Email: a_llamor@xxx.com   Tel: 033-XXXXXXX local XXXX

[1]

WHY DON'T YOU JOIN PAPER BRIQUETTE PRODUCTION?

■Allowance

·   Fixed pay 30 PHP/day

If you successfully produce 150 pieces per day, you will be paid a bonus.

*A bonus: 1 PHP per 4 pieces for paper briquettes which you additionally produce more than 150 pieces

·   Payment will be done twice a week

*You will be paid your salary for 3 days on every Wednesday and Saturday

Contact:

(1) Maki Ikuse (Project Manager)

The University of Tokyo, Japan

Email: maki.utokyo.cpu@xxx.com   Tel:09-XXXXXXXXX

(2) Professor Aries Roda D. Romallosa (Co-investigator)

Central Philippine University, Jaro, Iloilo City 5000

Email: a_llamor@xxx.com   Tel: 033-XXXXXXX local XXXX

[2]

WHY DON'T YOU JOIN PAPER BRIQUETTE PRODUCTION?

■Allowance

· Fixed pay 65 PHP /day

* Your salary does not depend on the amount of your production.

· Payment will be done twice a week

*You will be paid your salary for 3 days on every Wednesday and Saturday

Contact:

(1) Maki Ikuse (Project Manager)

The University of Tokyo, Japan

Email: maki.utokyo.cpu@xxx.com   Tel:09-XXXXXXXXXX

(2) Professor Aries Roda D. Romallosa (Co-investigator)

Central Philippine University, Jaro, Iloilo City 5000

Email: a_llamor@xxx.com   Tel: 033-XXXXXXX local XXXX

[3]

WHY DON'T YOU JOIN PAPER BRIQUETTE PRODUCTION?

■Allowance

· 1 PHP per 4 pieces of paper briquettes

* Your salary will depend on the amount of your production.

· Payment will be done everyday.

*You will be paid your salary everyday.

Contact:

(1) Maki Ikuse (Project Manager)

The University of Tokyo, Japan

Email: maki.utokyo.cpu@xxx.com   Tel:09-XXXXXXXXX

(2) Professor Aries Roda D. Romallosa (Co-investigator)

Central Philippine University, Jaro, Iloilo City 5000

Email: a_llamor@xxx.com   Tel: 033-XXXXXXX local XXXX

[4]